





# Stereoscopic Studies of **ANATOMY**

QM 25  
C8  
190-  
V.4  
Biology  
Library

Prepared under authority of the  
University of Edinburgh

by

**Professor D. J. Cunningham**

F.R.S., M.D. (Edin. et Dubl.), D.S.C. (Glasg. et St. And.), D.C.L. (Oxon.)

Edited by

**David Waterston**

M.A., M.D., F.R.C.S.E., F.R.S.E., Lecturer and Senior Demonstrator of Anatomy,  
University of Edinburgh

**Professor M. H. Cryer**

M.D., D.D.S., Professor of Oral Surgery, University of Penn.; Visiting Surgeon,  
Phila. General Hospital, etc.

**Frederick E. Neres**

M.D., formerly Instructor in Otology and Operative Otology, New York Post  
Graduate Medical School and Hospital; Chief of Clinic, Manhattan  
Eye, Ear, Nose and Throat Hospital, New York City

---

**NEW REVISED EDITION**

**Section IV**

---

**NEW YORK**

**Imperial Publishing Company**

# Stereoscopic Studies of Anatomy

## Section IV

### Table of Contents

#### MEDIASTINA

- No. 1.—Interior of Thorax, after removal of the Thymus Gland, the Pericardium, and its contents, &c.
- No. 2.—The Heart Bed, viewed from the left side.
- No. 3.—The Mediastinal Partition, viewed from the right side.
- No. 4.—The Superior Mediastinum, viewed from the front.
- No. 5.—Superior Mediastinum and upper portions of the Pleural Membranes, viewed from the front.
- No. 6.—The Aortic Arch and the Posterior Mediastinum.

#### Lungs

- No. 7.—The Lungs, viewed from above and in front.
- No. 8.—Mediastinal surface of the left Lung hardened *in situ*.
- No. 9.—Mediastinal surface of right Lung.

#### UPPER LIMB

##### Surface Anatomy

- No. 10.—Shoulder from the front.
- No. 11.—The Back.
- No. 12.—Shoulder from behind.
- No. 13.—Front of Forearm.
- No. 14.—Back of Forearm.

#### Back

- No. 15.—First layer of Muscles.
- No. 16.—Second layer of Muscles.

#### Scapular Region

- No. 17.—Superficial Structures.
- No. 18.—Muscles of Scapular Region.
- No. 19.—Quadrilateral and Triangular Spaces.

#### Back of Arm

- No. 20.—Musculo-spiral Nerve and the Tricep Muscle.

#### Back of Forearm and Wristjoint

- No. 21.—Muscles of Back of Forearm and sect. Synovial Cavities at the Wrist.

#### Axilla

- No. 22.—Outlet of Axilla and Axillary Fascia.
- No. 23.—Walls of Axilla.
- No. 24.—Costo-coracoid Membrane.
- No. 25.—Contents of Axilla.

#### Antecubital Fossa

- No. 26.—Superficial Structures.
- No. 27.—Boundaries of the Space.
- No. 28.—Contents of the Space.

#### Front of Forearm

- No. 29.—Superficial Muscles, &c.

#### Front of Forearm and Palm

- No. 30.—Deep Palmar Arch, &c.

#### Palm of Hand

- No. 31.—Superficial Dissection.
- No. 32.—Palmar Arch and Flexor Tendons and Nerves.

#### Articulations

- No. 33.—Elbow and Shoulder Joints, from the front.
- No. 34.—The same, from behind.

## THORAX.

## MEDIASTINA—No. 1.

INTERIOR OF THORAX, AFTER REMOVAL OF THE THYMUS GLAND, THE PERICARDIUM, AND ITS CONTENTS, ETC.

In the SUPERIOR MEDIASTINUM, the left innominate vein (1) formed behind the sternal end of the left clavicle, passes obliquely across to join the right innominate vein and form the superior vena cava behind the first right costal cartilage, receiving in its course the inferior thyroid, vertebral, internal mammary, first intercostal, and superior intercostal veins of the left side.

The trachea passes downwards with a slight inclination to the right, and terminates at the upper border of the 5th dorsal vertebra, by dividing into the two BRONCHI, which pass to the roots of the lungs. The right bronchus, which is shorter, but larger and more vertical than the left one, is crossed in front by the right phrenic nerve and the superior vena cava, and the vena azygos major arches over it, while the aortic arch (5) with the left recurrent laryngeal nerve hooking round it, crosses over the left bronchus, and the descending thoracic aorta passes behind it.

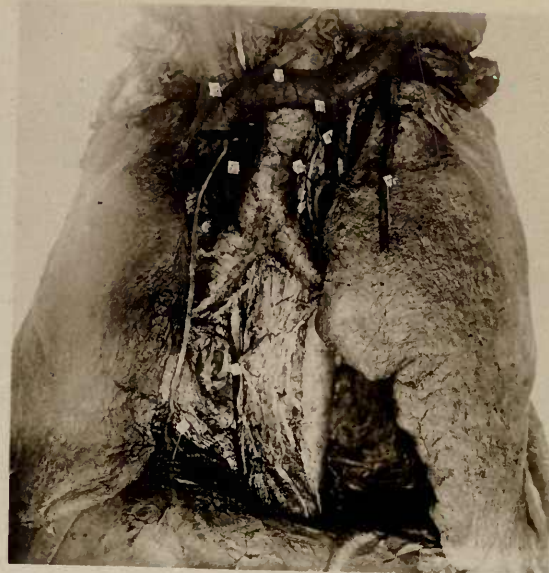
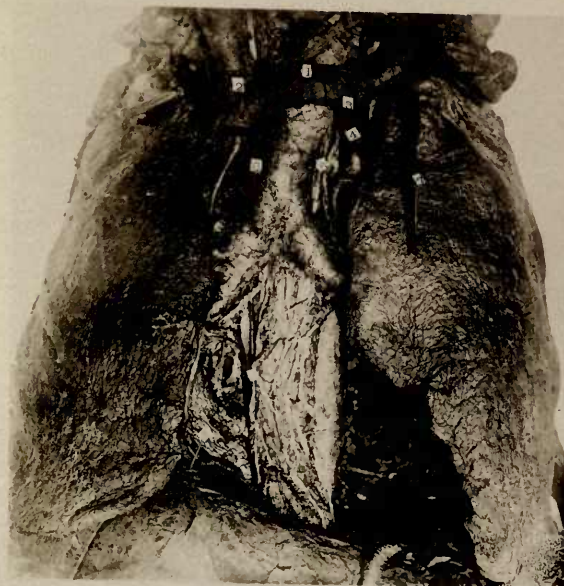
In the POSTERIOR MEDIASTINUM the oesophagus (9) with the plexus gulae on its wall, lies first to the right, then in front, and, lower down, to the left of the descending thoracic aorta.

The anterior margins of the lungs overlap the hollow for the heart, the right being straight and the left notched, the mediastinal surface of the left lung presents a distinct depression for the heart and pericardium, while the corresponding surface of the right lung is less concave.

*The figures indicate—*

- |   |                                  |
|---|----------------------------------|
| 1. Left innominate vein.  | 5. Aortic arch.                  |
| 2. Formation of superior vena cava, and termination of right internal mammary vein. | 6. Vena azygos major.            |
| 3. Left internal mammary vein.  | 7. Left internal mammary artery. |
| 4. Left subclavian artery, and left vagus nerve.                                    | 8. Right phrenic nerve.          |
|   | 9. Oesophagus and plexus gulae.  |

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY





## THORAX.

## MEDIASTINA.—No. 2.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

## THE HEART BED. VIEWED FROM THE LEFT SIDE.

The pleural membranes, heart and pericardium, and the left lung have been removed, and the aortic arch and its branches cut across.

The mediastinum, occupying the interval between the two pleural membranes, is composed of a number of structures, and is divided into four parts.

The pericardium and its contents occupy the MIDDLE mediastinum, while the ANTERIOR mediastinum lies in front of it, the POSTERIOR behind, and the SUPERIOR above.

This view illustrates the immediate relations of the pericardial sac on the right side and behind.

The left superior intercostal vein is seen passing to join the left innominate vein, and the recurrent laryngeal nerve of the left side passing upwards between the trachea and the oesophagus.

In the posterior mediastinum, the oesophagus is seen to lie at first to the right of the descending thoracic aorta, and then to pass forwards in front of it at the level of the ninth dorsal vertebra.

*The figures indicate—*

- |  |   |
|--|---|
| 1. Upper part of trachea.  | 7. Right lung.  |
| 2. Formation of superior vena cava by the junction of the right and left innominate veins. | 8. Termination of the right phrenic nerve in the diaphragm. |
| 3. Left innominate vein.   | 9. Plexus gulæ on wall of oesophagus.                       |
| 4. Left superior intercostal vein.   | 10. Left superior intercostal artery.                       |
| 5. Aortic arch cut across.   | 11. Gangliated cord of sympathetic.                         |
| 6. Vena azygos major, arching over right bronchus.   | 12. Great splanchnic nerve.                                 |





**THORAX.****MEDIASTINA.—No. 3.**

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

**THE MEDIASTINAL PARTITION, VIEWED FROM THE RIGHT SIDE.**

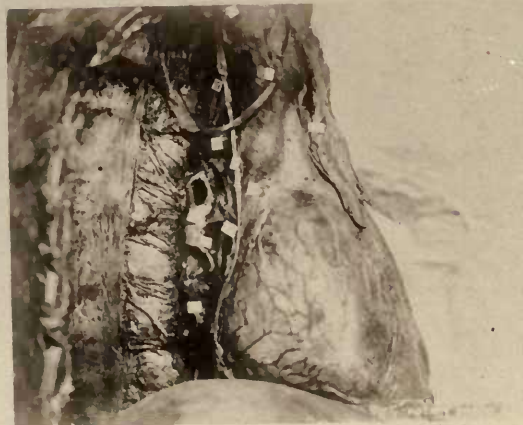
The thoracic cavity having been opened, the lungs have been removed, and the mediastinal pleura stripped from the surface of the mediastinal partition.

The relative size of the subdivisions of the mediastinum is brought out, as well as their shape.

This view illustrates the structures which are in relation to the inner surface of the right lung, and should be studied with the view of that surface. (Lungs No. 2).

*The figures indicate—*

1. Termination of superior vena cava.
2. Formation of superior vena cava, joined in this specimen by an unusual mediastinal vein.
3. Junction of right subclavian and right external jugular veins to form right innominate vein.
6. Vena azygos major.
8. Right phrenic nerve passing down in front of the root of the lung.
9. Right vagus nerve.
10. Right bronchus. The eparterial bronchus lies above the figure and the main trunk below it.
11. Main trunk of the right pulmonary artery.
12. Upper left pulmonary vein.
13. Lower left pulmonary vein.





## THORAX.

## MEDIASTINA.—No. 4.

BIOLOGY LIBRARY

THE GENERAL LIBRARY

UNIVERSITY OF CALIFORNIA

BERKELEY, CALIFORNIA 94720

## THE SUPERIOR MEDIASTINUM VIEWED FROM THE FRONT.

The clavicles and first costal arches have been divided, and the manubrium sterni with the origins of the sterno-hyoid and sterno-thyroid muscles turned up, exposing the superior mediastinum.

The upper part of the thymus gland is seen in the form of two lobes lying on the left innominate vein—the lower part of the gland which lay in front of the pericardium has been removed.

The intimate relation of the innominate veins to the pleural membranes is well shown.

The thymic and inferior thyroid veins are large and form a plexus.

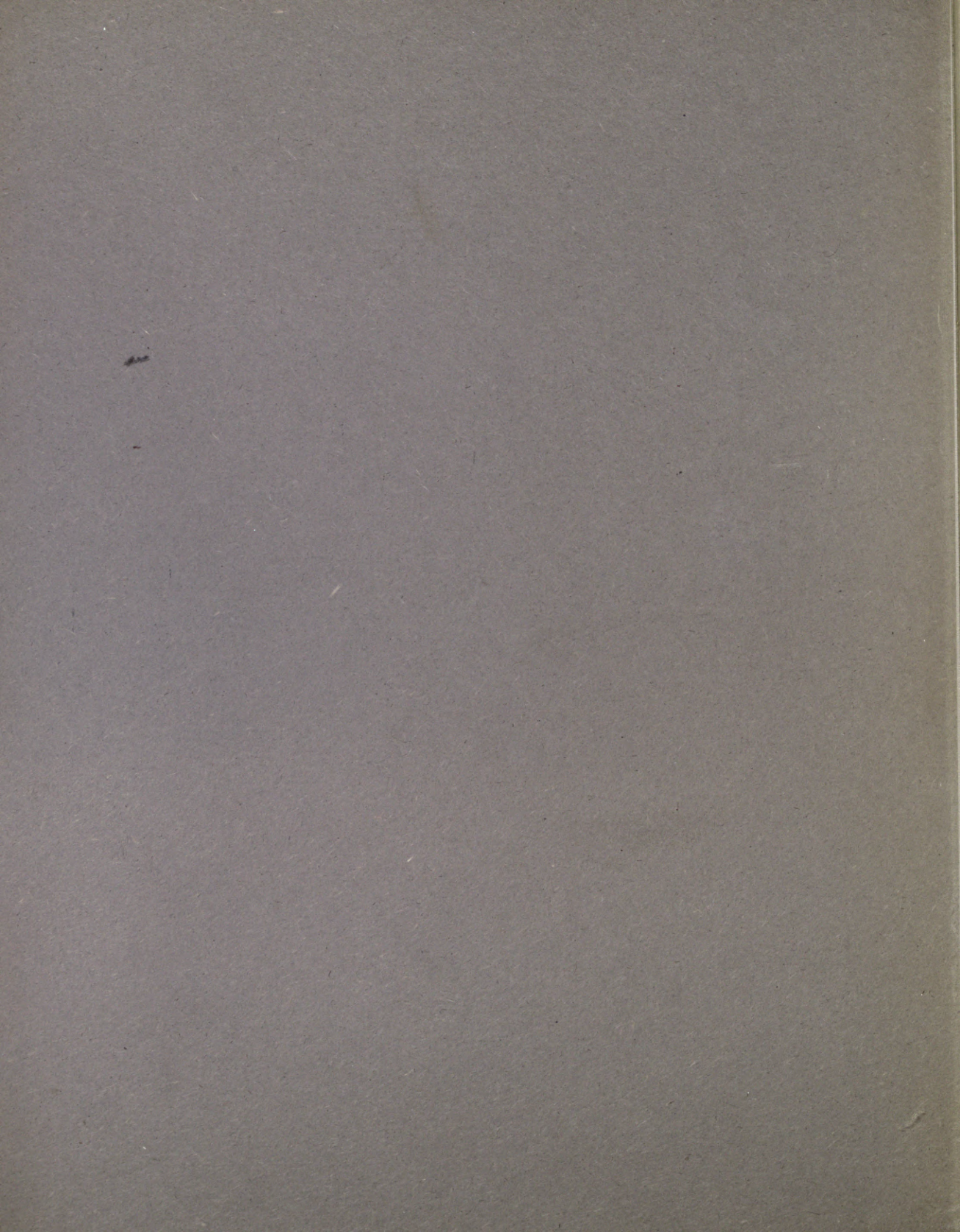
The attachments of the sterno-hyoid and sterno-thyroid muscles to the back of the manubrium are seen, and, between the sterno-thyroids, the interclavicular ligament.

The internal jugular veins become dilated just above their junction with the subclavian veins forming the inferior jugular bulb.

*The figures indicate—*

- |   |   |
|---|---|
| 1. Internal mammary artery lying on the pleura.           | 7. Innominate artery.                               |
| 2. Left innominate vein, with thymus gland resting on it. | 8. Right and left vagi, within the carotid sheaths. |
| 3. Right innominate vein.                                 | 9. Mediastinal lymphatic glands.                    |
| 4. Upper part of thymus gland (two lobes).                | 10. Inferior thyroid vein.                          |
| 5. Isthmus of thyroid gland.                              | 11. Sterno-thyroid muscle.                          |
| 6. Left common carotid artery.                            | 12. Sterno-hyoid muscle.                            |





## THORAX.

## MEDIASTINA—No. 5.

BIOLOGY LIBRARY

THE GENERAL LIBRARY

UNIVERSITY OF CALIFORNIA

BERKELEY, CALIFORNIA 94720

SUPERIOR MEDIASTINUM AND UPPER PORTIONS OF THE PLEURAL MEMBRANES VIEWED  
FROM THE FRONT.

After exposure of the superior mediastinum, the thymus and lymphatic glands, the innominate veins, and the superior vena cava have been removed.

The aortic arch and the branches rising from it are seen in their relation to the trachea and pleura. The root of the left common carotid artery is here united with the innominate artery, a fairly common variation from the normal arrangement.

The vessels and nerves in relation to the pleura are well seen, and especially the course of the phrenic and vagi nerves. The vagi sink backwards to reach the posterior aspect of the roots of the lungs, while the phrenics pass down on an anterior plane.

The distended veins at the root of the neck are seen to be of formidable size.

*The figures indicate—*

- |  |   |
|--|---|
| 1. Upper limit of serous pericardium.  | 10. Pleura.   |
| 2. Aortic arch.  | 11. Right internal mammary artery and phrenic nerve.  |
| 3. Innominate artery.  | 12. Vagus nerves, the right giving off its recurrent laryngeal branch, and the left lower down, a cardiac branch. |
| 4. Left common carotid artery.   | 13. Isthmus of thyroid gland.   |
| 5. Left subclavian artery.   | 14. Trachea.  |
| 6. Right common carotid artery.  | 15. Vena azygos major, opening into the superior vena cava.   |
| 7. Right subclavian artery.  |   |
| 8. Internal jugular veins.   |   |
| 9. Subclavian veins, receiving external jugular and transversalis colli veins. |   |

SECTION IV.





## THORAX.

## MEDIASTINA—No. 6.

## THE AORTIC ARCH AND THE POSTERIOR MEDIASTINUM.

The lungs, heart and pericardium, and the superficial structures of the superior mediastinum have been removed, and also the lower part of the ascending aorta.

The phrenic nerves are cut short, as their course has already been seen.

This view illustrates especially the direction of the aortic arch, the course of the two vagi, the formation of the plexus gulæ and the deep cardiac plexus, and the relations of the descending thoracic aorta and the oesophagus.

*The figures indicate—*

1. Aortic arch.
2. Innominate artery, bifurcating into the right common carotid and right subclavian.
3. Left common carotid artery.
4. Left subclavian artery.
5. Vena azygos major arching over the root of the right lung.
6. Internal mammary arteries, crossed higher up by the phrenic nerves.
7. Right vagus nerve at the point where it crosses the subclavian artery, and gives off the recurrent laryngeal branch.
8. Left vagus nerve crossing the aortic arch and giving off its recurrent laryngeal branch.
9. Left phrenic nerve at its upper part and at its termination in the diaphragm.
10. Right phrenic nerve at its upper part and termination.
11. Oesophagus and the plexus gulæ on its wall.
12. Trachea.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
LIBRARY, CALIFORNIA 94720  
BIOLOGY LIBRARY





## THORAX.

## LUNGS—No. 1.

## THE LUNGS, VIEWED FROM ABOVE AND IN FRONT.

The lungs are conical in shape, and each presents an apex, base, and outer and inner surfaces, separated by anterior and posterior margins.

The apex of each lung is seen projecting upwards above a constriction due to the first rib, and the anterior sharp margin in each begins below the level of this constriction.

The outer surface is markedly indented by the costal arches, and the fissures are seen; the oblique fissure in the left and the transverse fissure in the right.

The impressions due to vessels on the apex are well seen.

The course of the internal mammary artery can be traced on outer surface of each lung as a distinct narrow groove, running vertically near the anterior margin.

*The figures indicate—***IN BOTH:—**

1. The apex.
2. Groove for the first rib.
3. Upper end of the anterior sharp margin.

**IN THE LEFT LUNG (L.):—**

4. The oblique fissure.

5. Subclavian groove.

**IN THE RIGHT LUNG (R.):—**

6. Transverse fissure.
7. Groove for right innominate vein.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

SECTION IV.





## THORAX.

## LUNGS—No. 2.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

## MEDIASTINAL SURFACE OF THE LEFT LUNG HARDENED IN SITU.

This surface shows impressions due to the structures of the mediastinum with which it was in contact.

In the front is a hollow, adapted to receive the heart and pericardium, deeper and more extensive in this lung than in the right. Above and behind it is the hilum with the divided bronchus, pulmonary artery and veins, and some lymphatic glands, surrounded by the reflection of the pleura, which is continued downwards as the ligamentum latum pulmonis. Arching over the hilum and passing downwards is a groove for the aortic arch and descending thoracic aorta (10, 8 and 5), from which a deep groove passes upwards towards the apex, for the subclavian artery.

In front of this again is a groove for the innominate vein, short and wide, and the great fissure is seen intersecting the rounded posterior border.

A small area in front of the ligamentum latum, near the lower margin, is in contact with the oesophagus.

*The figures indicate—*

- |  |   |
|--|---|
| 1. Pulmonary artery.                     | 8. Deep groove for commencement of descending thoracic aorta. |
| 2. Pulmonary veins.                      | 9. Commencement of the fissure of the lung.                   |
| 3. Bronchus.                             | 10. Groove for aortic arch.                                   |
| 4. Bronchial gland.                      | 11. Subclavian groove.  |
| 5. Groove for descending thoracic aorta. | 12. Groove for innominate vein.                               |
| 6. Groove for heart and pericardium.     |   |
| 7. Ligamentum latum pulmonis.            |   |





## THORAX.

## LUNGS—No. 3.

## MEDIASTINAL SURFACE OF RIGHT LUNG.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

The inner surface of this lung shows in front a cardiac depression. Behind it is the hilum, which differs from that of the left side, since the right bronchus gives off, shortly after its commencement, an eparterial branch, which enters the lung separately from the main bronchus and at a higher level. It is accompanied by a branch of the right pulmonary artery.

Above the hilum is a curved groove for the vena azygos major, and at a still higher level are two vertical grooves, the anterior for the superior vena cava, the posterior, most distinct near the apex, for the innominate artery.

The chief, or oblique, fissure is seen intersecting the lung.

The surface for the oesophagus is not very distinct in this specimen. In front of the ligamentum latum, near the lower margin, is a wide groove for the inferior vena cava, passing into the cardiac hollow.

*The figures indicate—*

- |  |  |
|--|--|
| 1. Pulmonary artery.                     | 7. Groove for superior vena cava.                          |
| 2. Pulmonary veins.                      | 8. Groove for innominate artery (more distinct higher up). |
| 3. Main bronchus, and eparterial branch. | 9. Groove for vena azygos major.                           |
| 4. Bronchial glands.                     | 10. Ligamentum latum pulmonis.                             |
| 5. Groove for the inferior vena cava.    | 11. Surface for the oesophagus.                            |
| 6. Cardiac surface.                      | 12. Great or oblique fissure.                              |





## UPPER LIMB.

## SURFACE ANATOMY—No. 1.

## AXILLA AND SHOULDER FROM THE FRONT.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY

The region of the shoulder and upper arm is so uniformly clothed by muscles that few bony points can be made out except by deep palpation.

Thus the **coracoid process** can be felt at the outer part of the small intermuscular depression between the pectoralis major and deltoid muscles above the figure 1, and the upper part of the shaft of the humerus can be palpated along the line of the depression, between the biceps and coraco-brachialis muscles on the outer side, and the triceps on the inner, indicated by the figure 5.

The muscular structures are important and well marked.

Notice especially the rounded outline of the deltoid as it arches over the shoulder. The anterior margin of this muscle is in apposition with the upper margin of the pectoralis major, and can hardly be distinguished from it except at the attachment of the two muscles to the clavicle, where there is a small depression, already referred to.

The hollow of the axilla is bounded in front by the margin of the pectoralis major, which presents a beautiful sinuous outline, while behind, the thick rounded margin is formed by the latissimus dorsi, teres major and subscapularis muscles.

In front of these last muscles, on the inner wall of the axilla, some of the digitations of the serratus magnus muscle are distinct at their attachments to the ribs.

The outer boundary of the axilla shows the rounded belly of the biceps, while at a higher level, the coraco-brachialis is seen in the interval between the biceps and the pectoralis major. The axillary artery lies along its lower margin and runs down to the point indicated by the figure 5.

*The figures indicate:—*

- |  |   |
|--|---|
| Muscles. 1. Pectoralis major, clavicular part. | Muscles. 4. Belly of biceps.                    |
| 2. " " sterno-costal part.                     | 5. Intermuscular interval over brachial artery. |
| 3. Deltoid.                                    | 6. Latissimus dorsi.                            |





**UPPER LIMB.**  
**SURFACE ANATOMY—No. 3.**  
**UPPER PART OF THE BACK.**

BIOLOGY LIBRARY  
 THE GENERAL LIBRARY  
 UNIVERSITY OF CALIFORNIA  
 BERKELEY, CALIFORNIA 94720

The spines of the vertebræ lie at the bottom of a furrow between the erector spinæ and other muscles on each side.

The spine of the vertebra prominens (seventh cervical) can usually be detected, but that of the first dorsal vertebra immediately below it is often equally distinct. The other dorsal spines can only be distinguished with difficulty.

The outline of the scapula is obscured by muscles covering it, but the lower angle can be made out by palpation, and the spine and acromion process can also be readily felt. About the scapula itself there are several hollows and elevations, which vary very considerably in different individuals on account of the varying sizes of different muscles.

The upper margin of the trapezius slopes outwards from the neck to the clavicle (4) and some of its fleshy fibres below this level form an elevation just above the spine of the scapula (1).

When the arms are in the attitude shown here, the scapula is rotated, so that the inner end of the spine is displaced downwards, and the lower angle of the bone rotated outwards. This accounts for the apparently low position of the spine of the scapula. Below the spine is seen a rounded elevation showing the position of the rhomboideus major muscle. The root of the spine of the scapula usually lies at the level of the second dorsal vertebra, and the lower angle of the scapula extends down to the seventh rib. The 'triangle of auscultation' lies to the inner side of this lower angle.

*The figures indicate—*

- |                        |                               |                              |
|------------------------|-------------------------------|------------------------------|
| 1. Trapezius muscle.   | 3. Spine of scapula.          | 6. Rhomboideus major muscle. |
| 2. Vertebra prominens. | 4. Upper margin of trapezius. | 7. Acromion process.         |
|                        | 5. Deltoid muscle.            |                              |





## UPPER LIMB.

## SURFACE ANATOMY.—No. 2.

## SHOULDER AND SCAPULAR REGION FROM BEHIND.

With this view, the dissections of the scapular region should be studied.

The bony points which are of service in this region are the spine (1) and the acromion process (2) of the scapula, both of which lie at the bottom of a slight depression between the trapezius and deltoid muscles.

The muscular elevations here also are of great use. The posterior border of the deltoid is distinct, passing down to the hollow on the outer aspect of the upper arm which marks the insertion of the muscle.

In the arm itself are found the different portions of the triceps muscle, the long head passing down from the scapula, the outer head forming a prominence to its outer side, covering over the musculo-spiral groove and its contents, while the inner head shows itself on a small area rather lower down.

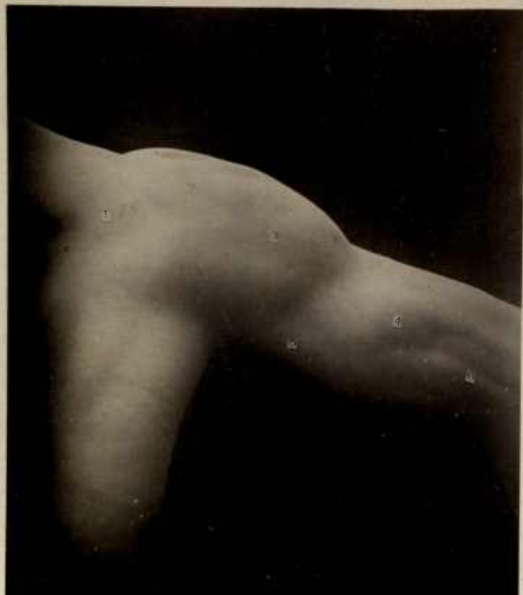
The deltoid here overlaps the scapular muscles and the circumflex nerve and posterior circumflex vessels, as they wind round the neck of the humerus.

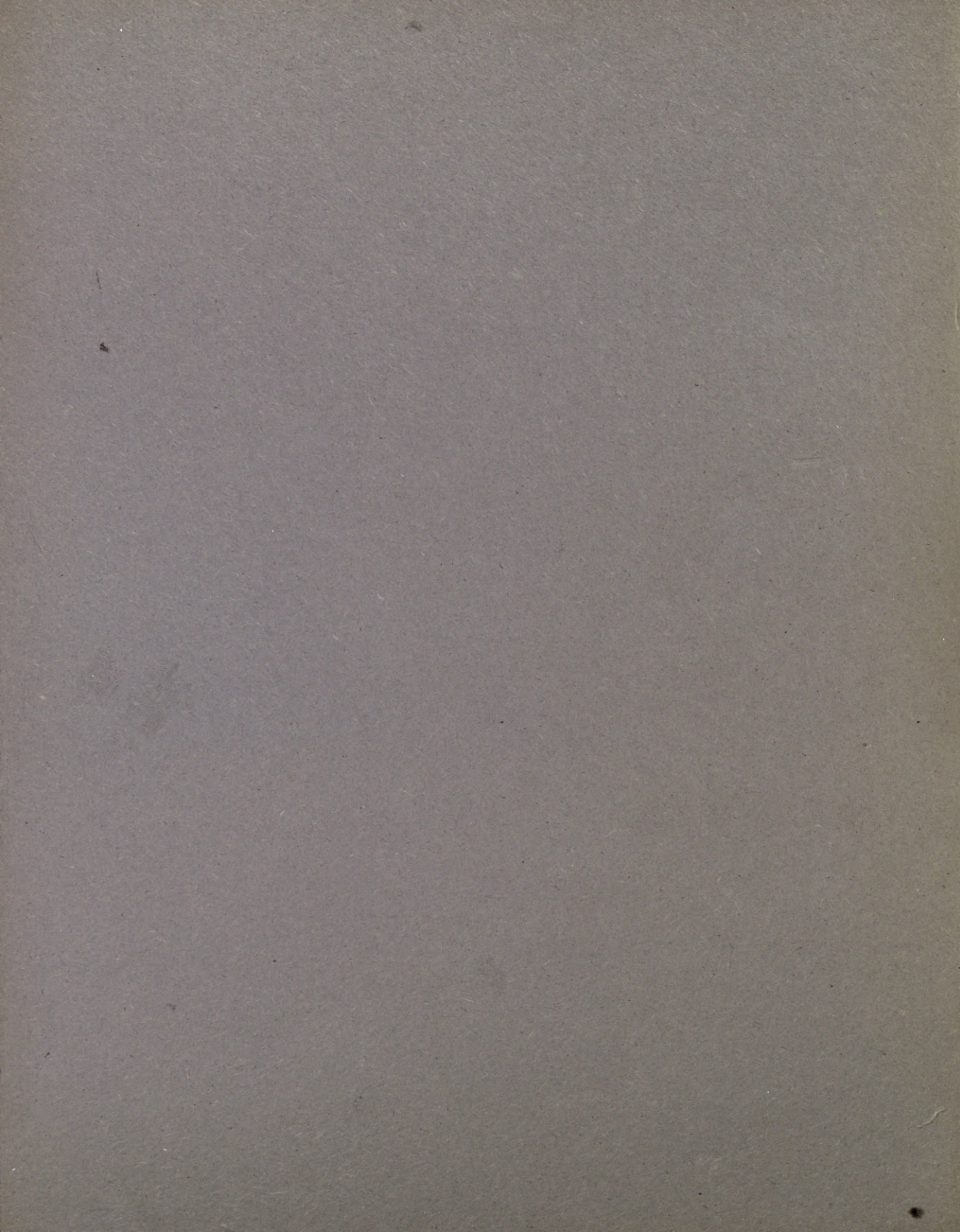
---

*The figures indicate—*

- |                      |                                  |
|----------------------|----------------------------------|
| 1. Spine of scapula. | 4. Outer head of triceps muscle. |
| 2. Acromion process. | 5. Long head of triceps muscle.  |
| 3. Deltoid muscle.   | 6. Inner head of triceps muscle. |

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY





## UPPER LIMB.

## SURFACE ANATOMY.—No. 4.

## FRONT OF FOREARM.

BIOLOGY LIBRARY

THE GENERAL LIBRARY

UNIVERSITY OF CALIFORNIA

BERKELEY, CALIFORNIA 94720

The region of the elbow and front of the forearm presents one or two bony points which can be recognised from the surface, but in the upper part of the forearm the presence of the large muscular bellies conceals the shafts of the radius and ulna. The individual muscles cannot be readily distinguished from one another, but groups of them can be recognised, and the slight depression corresponding to the antecubital fossa separates an outer, or supinator, group from an inner, or pronator and flexor, group.

In the lower part of the forearm, the muscle bellies are largely replaced by tendons, and several of these can be recognised, as well as the intervening hollows in which vessels and nerves are situated.

These should be carefully studied, since wounds of this region are of common occurrence, and frequently involve division of some of these tendons, and this leads to serious impairment of usefulness, unless the tendons are recognised and the several ends united. The same holds true of the median and ulnar nerves.

Taking the upper part first:—

The internal condyle of the humerus forms a prominent landmark, from which the pronator and flexor muscles pass in different directions down the forearm, the pronator radii teres being the outermost (see Dissection of Front of Forearm, No. 1).

The supinator longus (brachio-radialis) forms the projection on the outer margin of the forearm in this region.

The tendons in the lower part are, the flexor carpi radialis and palmaris longus, lying near one another in the middle, and the flexor carpi ulnaris near the inner border. To the outer side of the first set is the hollow in which the radial artery lies, and the median nerve lies almost under cover of the palmaris longus. The ulnar artery and nerve lie under cover of the margin of the flexor carpi ulnaris, and in the hollow to the outer side of that tendon lie the inner tendons of the flexor muscles of the fingers.

The elevation at 4 is the radial head of the flexor sublimis digitorum, on which lies the radial artery.

*The figures indicate—*

- |          |                          |                                 |                                  |
|----------|--------------------------|---------------------------------|----------------------------------|
| Muscles. | 1. Internal condyle.     | 3. Supinator longus.            | 5. Flexor carpi radialis tendon. |
|          | 2. Pronator radii teres. | 4. Flexor sublimis digitorum.   | 6. Palmaris longus tendon.       |
|          |                          | 7. Flexor carpi ulnaris tendon. |                                  |





## UPPER LIMB.

## SURFACE ANATOMY—No. 5.

## BACK OF FOREARM.

BIOLOGY LIBRARY  
THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720

The muscular elevations and hollows here are numerous and somewhat difficult.

Taking first the bony points, we find first the tip of the olecranon (1), and the external condyle of the humerus (8), below which is a depression in which the head of the radius lies.

In complete extension, the tip of the olecranon process passes up as far as to a line joining the external and internal condyles of the humerus.

In flexion, the olecranon passes down below this line. These facts assist greatly in differentiating between a dislocation of the elbow and a fracture through the lower end of the humerus.

At the wrist are the tubercle on the back of the radius (Lister's tubercle), and the lower end of the ulna.

Passing down from the external condyle are the supinator longus and the two radial extensors, forming a single mass, and adjacent to them, but separated by a groove, is the common extensor of the fingers. Between these two groups in the lower part emerge the two deep extensors of the thumb (extensor ossis metacarpi and extensor primi internodii pollicis), which form an elevation on the radial border of the forearm.

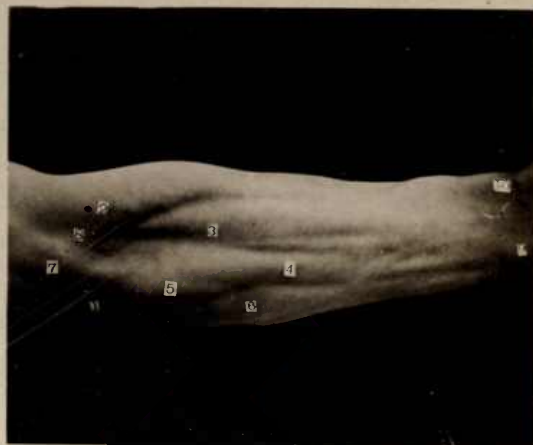
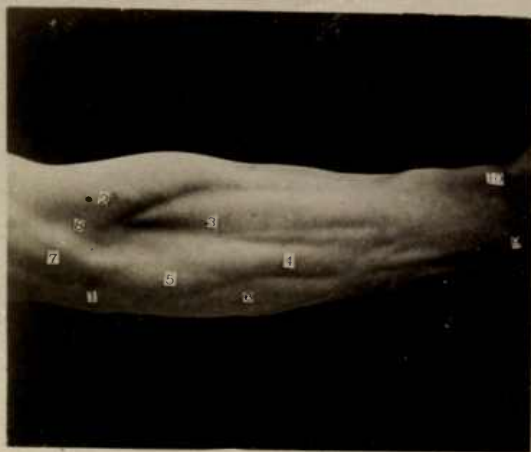
To the ulnar side of these muscles lies the extensor carpi ulnaris and a groove separating this muscle from the flexor carpi ulnaris. The bottom of this groove corresponds to the subcutaneous surface of the shaft of the ulna.

The prominence of the anconeus muscle lies external to the outer border of the olecranon process, and passes down by the side of the shaft of the ulna.

Between 3 and 4 is a small ridge, due to the belly of the extensor proprius minimi digiti.

*The figures indicate—*

- |   |                                      |
|---|--------------------------------------|
| 1. Olecranon process.                     | 6. Flexor carpi ulnaris.             |
| 2. Supinator longus and radial extensors. | 7. Triceps.                          |
| 3. Extensor communis digitorum.           | 8. External condyle.                 |
| 4. Extensor carpi ulnaris.                | 9. Lower end of ulna.                |
| 5. Anconeus.                              | 10. Lister's tubercle on the radius. |





## UPPER LIMB.

## BACK—No. 1.

THE SKIN AND LAYERS OF FASCIA HAVE BEEN REMOVED, TO SHOW THE CUTANEOUS NERVES AND THE FIRST LAYER OF MUSCLES.

The cutaneous nerves found in this region are the following:—

- (1) The **great occipital nerve**, from the posterior primary division of the second cervical nerve; pierces the trapezius, and passes upwards and outwards to supply the posterior part of the scalp.

Below this nerve is a small branch from the third cervical nerve, which passes upwards, and then one small twig also from the fourth and fifth, but these are variable.

- (2) Lower down, branches from the upper six dorsal nerves emerge near the middle line. All the above nerves come from the internal branches of the posterior primary divisions.

- (3) Below these, twigs from the external branches of the posterior primary divisions become superficial, but at some distance from the middle line.

- (4) The **small occipital nerve** runs upwards behind the posterior border of the sterno-mastoid muscle to the posterior part of the scalp, where it anastomoses with the **great occipital**. It is derived from the anterior primary divisions of the second and third cervical nerves, and is therefore a branch of the cervical plexus.

The **trapezius muscle** arises from the external occipital protuberance and from the inner half of the superior curved line of the occipital bone, from the ligamentum nuchæ and spine of the seventh cervical vertebra, and from the spines and supraspinous ligaments of all the dorsal vertebrae.

There is a quadrilateral aponeurotic area formed in the middle by a membranous portion of the muscle on each side.

**Triangle of auscultation.**—Between the lower border of the trapezius and the vertebral border of the scapula is an area, limited below by the upper border of the latissimus dorsi, in which the rhomboideus major is seen.

The remaining part of this area (14) is known as the triangle of auscultation, since in this region the chest wall is not covered by any thick mass of muscle, and therefore the lung sounds can be well heard here.

*The figures indicate:—*

Bony points. 1. External occipital protuberance.

2. Vertebra prominens.

3. Spine of scapula.

4. Lower angle of scapula.

Muscles. 5. Trapezius—Upper oblique fibres.

6. " Central tendon.

7. " Lower oblique fibres.

8. Rhomboideus major.

9. Latissimus dorsi.

Nerves. 10. Great occipital.

11. Small occipital.

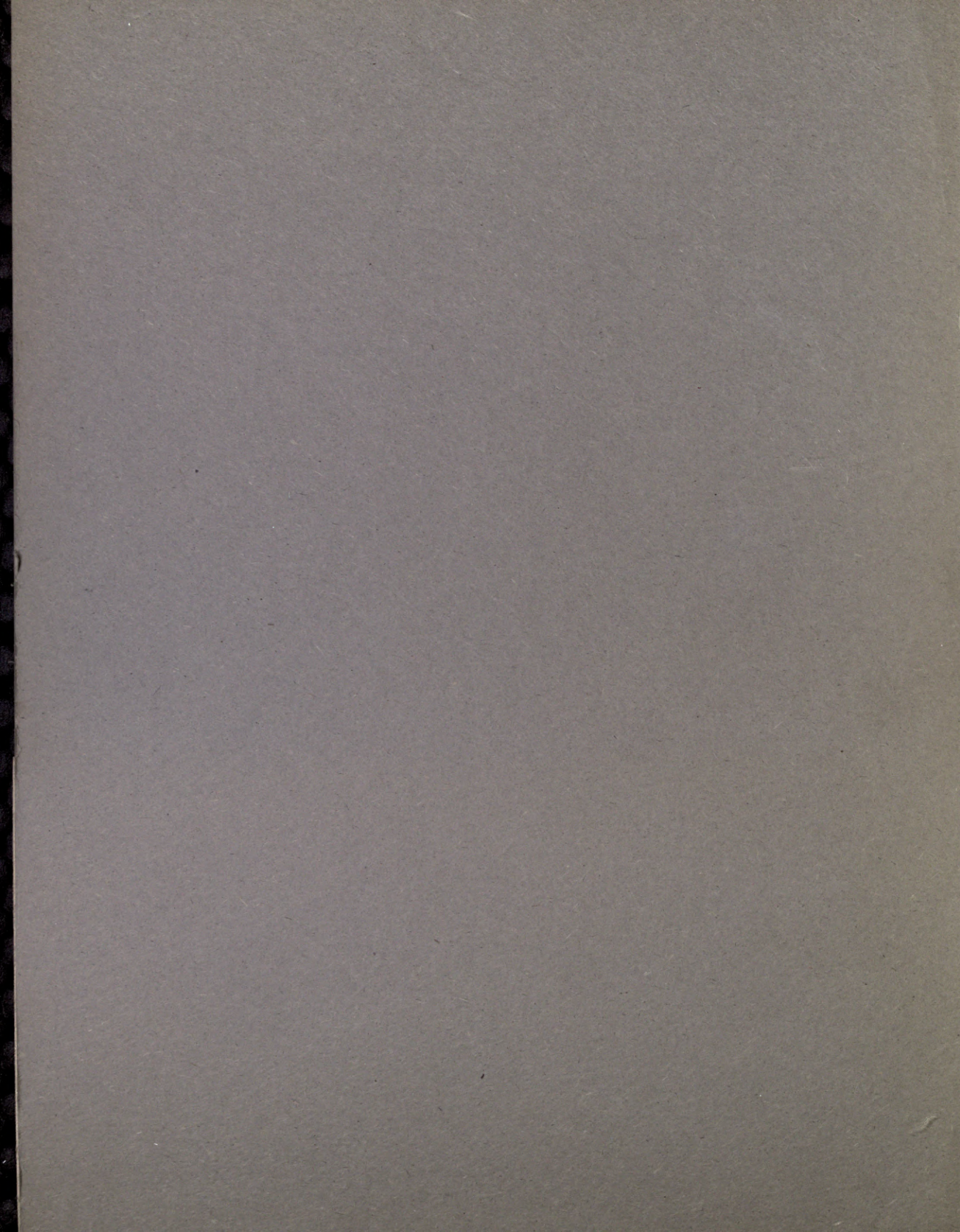
12. Internal cutaneous branches from dorsal nerves.

13. External cutaneous branches from dorsal nerves.

Area. 14. Triangle of auscultation.

UNIVERSITY OF CALIFORNIA  
LIBRARY  
94720





## UPPER LIMB.

## BACK.—No. 2.

THE TRAPEZIUS AND LATISSIMUS DORSI MUSCLES HAVE BEEN REFLECTED ON BOTH SIDES, AND THE RHOMBOID MUSCLES ON THE LEFT SIDE.

The rhomboid muscles lie side by side, and are separated from one another only by a small interval.

The *rhomboideus minor* arises from the lower part of the ligamentum nuchæ, and from the spines of the seventh cervical and first dorsal vertebræ and while the *rhomboideus major* arises from the spines of the upper four or five dorsal vertebræ below the first, and from the supra-spinous ligaments, and they are inserted into the vertebral border of the scapula, the lesser muscle opposite the root of the spine, and the greater one principally into the lower angle of the bone, but it is also attached as far up as to the spine by areolar tissue.

The rhomboids cover, among other structures, the serratus posticus superior muscle, and under the latissimus dorsi lies the serratus posticus inferior.

These two serrati muscles are extremely thin, and largely tendinous, and pass from the spines to the ribs, the upper muscle arising from the seventh cervical spine and the upper two or three dorsal, and being inserted into the second, third, fourth, and fifth ribs, external to their angles, while the lower arises from the two lower dorsal and two upper lumbar spines, and is inserted into the lower four ribs.

The levator anguli scapulæ is seen passing to its insertion into the base of the scapula from the upper angle to the spine.

*The figures indicate—*

- Muscles. 1. Trapezius.  
2. Latissimus dorsi.  
3. Rhomboideus major.  
4. Rhomboideus minor.  
5. Levator anguli scapulæ.  
6. Serratus posticus superior.

- Muscles. 7. Serratus posticus inferior.  
8. Ilio-costalis.  
9. Longissimus dorsi.  
Nerves. 10. Cutaneous external branch.  
11. Spinal accessory.  
12. Nerve to rhomboid muscles.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
DANIEL J. EVANS, LIBRARIAN  
BIOLOGY LIBRARY  
DANIEL J. EVANS, LIBRARIAN  
UNIVERSITY OF CALIFORNIA  
DANIEL J. EVANS, LIBRARIAN





## UPPER LIMB.

## SCAPULAR REGION—No. 1.

THE SKIN AND LAYERS OF FASCIA HAVE BEEN REMOVED FROM THE SURFACE OF THE DELTOID,  
THE BACK OF THE SCAPULA, AND THE BACK OF THE ARM.

The cutaneous nerves in this region are derived from some descending branches of the cervical plexus, which have been removed, and from the circumflex nerve, of which some branches wind round the posterior border of the deltoid, and some pierce the muscle, accompanied by small branches of the posterior circumflex artery.

The prominence of the shoulder is formed by the deltoid muscle, which has a wide origin from the outer third of the clavicle, the acromion process and the spine of the scapula, from which the fibres converge to the insertion into the outer aspect of the shaft of the humerus about its middle.

The deltoid covers the shoulder joint, and the muscles arising from the dorsal aspect of the scapula.

The quadrilateral space is concealed by the deltoid, but the triangular space is seen to be a small intermuscular interval lying between the teres major and teres minor—the latter being at present indistinguishable from the infra-spinatus muscle—below the long head of the triceps

*The figures indicate—*

Muscles—1. Deltoid.

2. Triceps, outer head.

3. Triceps, long head.

4. Teres major.

5. Latissimus dorsi.

Muscles—6. Infra-spinatus, and teres minor, with fascia.

7. Trapezius.

Nerves and Vessels—8 and 9. Cutaneous branches of circumflex nerve and posterior circumflex artery





## UPPER LIMB.

## SCAPULAR REGION.—No. 2

THE POSTERIOR PART OF THE DELTOID HAS BEEN REMOVED, TO SHOW THE MUSCLES, ETC.  
WHICH IT COVERS.

On the dorsal aspect of the scapula, below the spine of that bone, lie the infraspinatus, teres minor, and teres major muscles, while the latissimus dorsi also gains a slight origin from this surface of the bone at the lower angle.

The infraspinatus muscle arises from the infraspinous fossa, excepting a small part near the neck, and from the investing fascia. The teres minor arises from an elongated flat surface on the dorsal aspect of the axillary border of the scapula, and from the adjacent intermuscular septum, while the teres major arises from an oval area on the dorsal aspect of the lower angle of the scapula.

The infraspinatus and teres minor muscles pass upwards and outwards to the greater tuberosity of the humerus, covering the back of the shoulder-joint, while the teres major passes in front of the long head of the triceps and the humerus, to reach the inner lip of the bicipital groove of that bone.

Those three muscles receive their nerve supply from different sources, the infraspinatus from the suprascapular nerve, the teres minor from the circumflex, and the teres major from the lower subscapular nerve.

Access to the shoulder-joint from behind can be gained by separating or by dividing the infraspinatus and teres minor muscles after reflecting the deltoid muscle.

The nerves and vessels of this region are more fully exposed in the next view.

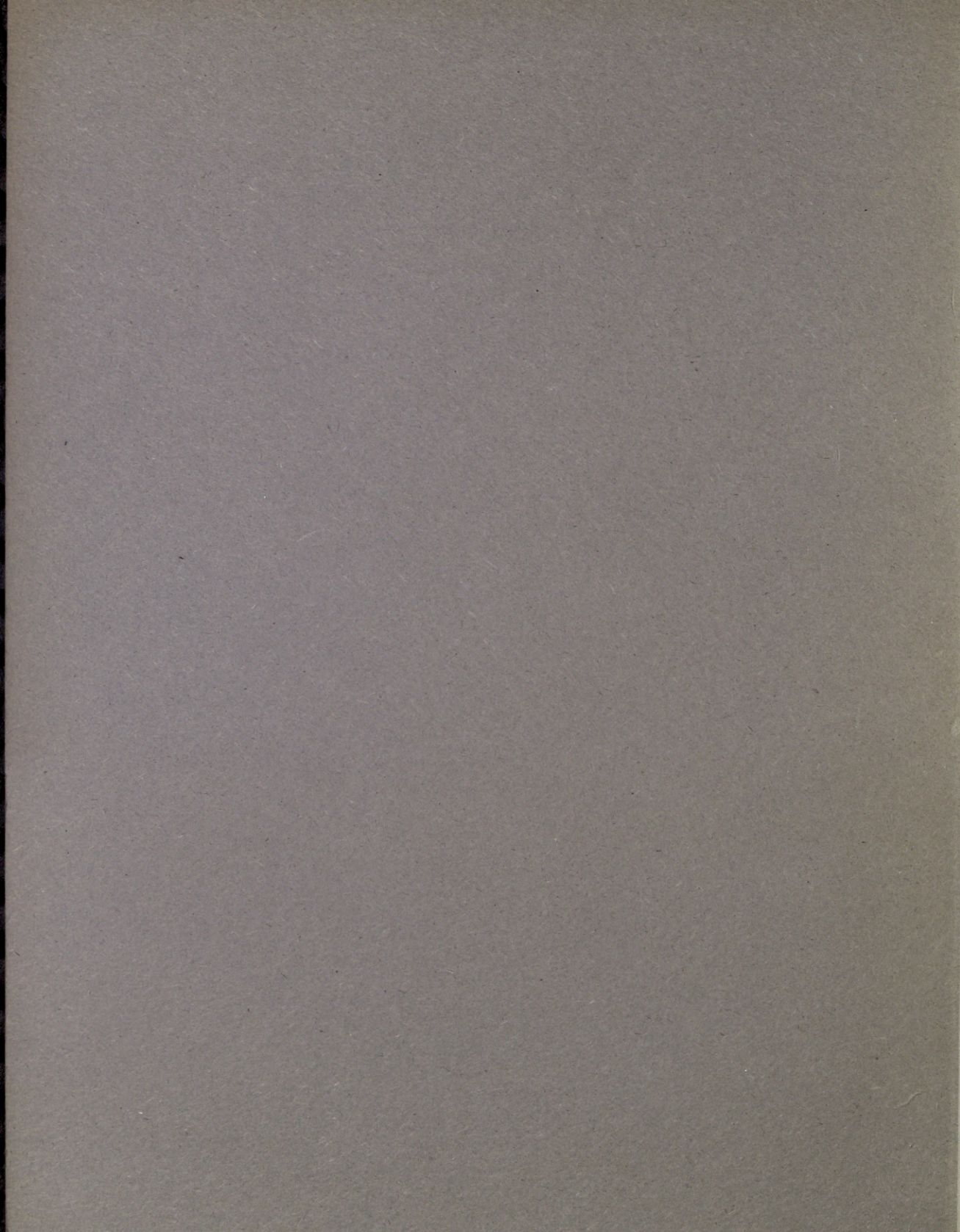
*The figures indicate—*

- Muscles. 1. Trapezius.  
2. Deltoid.  
3. Infraspinatus.  
4. Teres minor.  
5. Teres major.

- Muscles. 6. Latissimus dorsi.  
7. Long head of triceps.  
8. Outer head of triceps.  
9. Circumflex nerve.  
10. Posterior circumflex vessels.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY





## UPPER LIMB.

## SCAPULAR REGION—No. 3.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720

THE ACROMION PROCESS HAS BEEN REMOVED, AND THE INFRASPINATUS AND TERES MINOR MUSCLES CUT AWAY, IN ADDITION TO THE FORMER DISSECTION.

The outer head of the triceps passes up along the shaft of the humerus nearly to the great tuberosity.

The long head of the triceps is attached to the vertebral border of the scapula below the glenoid fossa, and, passing down, it intersects a triangular interval between the teres major and the teres minor, dividing it into an upper and a lower part, and the upper part is known as the quadrilateral space, and the lower as the triangular. These spaces, as will be noticed, are not present in the undissected subject except as intermuscular intervals, and can only be seen as spaces by an artificial separation.

The quadrilateral space is bounded above by the teres minor, below by the teres major, internally by the long head of the triceps, and on the outer side by the humerus, and it transmits the circumflex nerve and the posterior circumflex vessels in their course from the axilla to this region.

In the lower, or triangular space, the dorsalis scapulæ artery makes its appearance, and it winds round the border of the scapula, to be distributed principally to the infraspinous fossa.

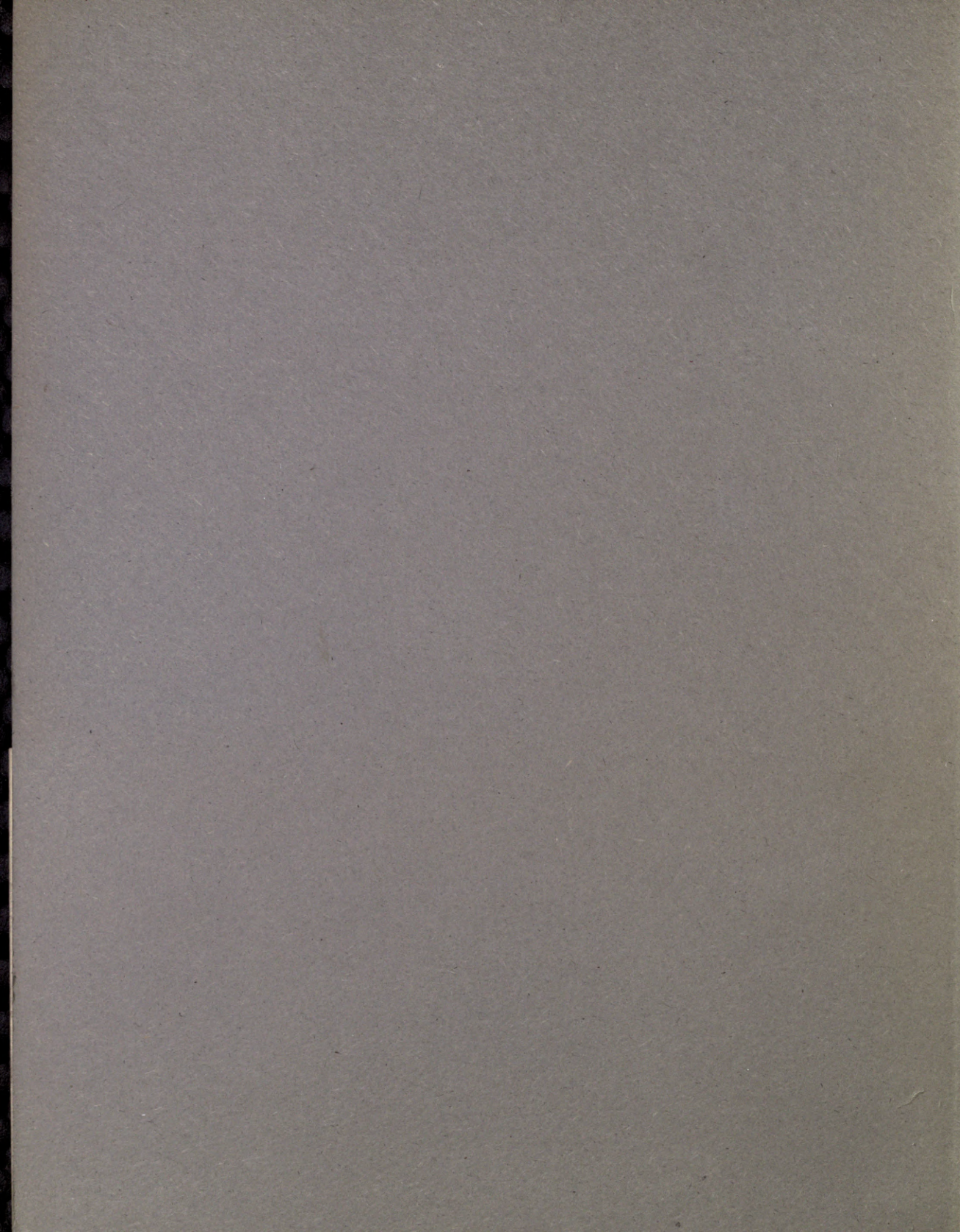
The nerves and blood-vessels of the scapular region are arranged as follows:—

A branch of the suprascapular artery passes into the infraspinous fossa below the root of the acromion, with the termination of the suprascapular nerve, and anastomoses with the dorsalis scapulæ, and both of these vessels anastomose with the posterior scapular artery, which runs along the vertebral border, under cover of the rhomboid muscles.

*The figures indicate—*

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| 1. Trapezius.                     | 7. Glenoid ligament.               |
| 2. Supraspinatus.                 | 8. Suprascapular artery and nerve. |
| 3. Infraspinatus and teres minor. | 9. Dorsalis scapulæ artery.        |
| 4. Teres major.                   | 10. Outer head of triceps.         |
| 5. Long head of triceps.          | 11. Deltoid.                       |
| 6. Capsular ligament of shoulder. |                                    |





## UPPER LIMB.

## BACK OF ARM—No. 1.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
DARKEN, CALIFORNIA 94720

A PORTION OF THE OUTER HEAD OF THE TRICEPS HAS BEEN REMOVED, TO SHOW THE MUSCULO-SPIRAL GROOVE AND ITS CONTENTS.

**Triceps.**—The outer head of this muscle arises from the posterior surface of the shaft of the humerus above the musculo-spiral groove, and from a fibrous arch which covers over the groove, while the inner head of the muscle arises from the back of the humerus below that groove, and from the intermuscular septa on either side.

**Musculo-spiral groove.**—This groove winds round the back of the humerus in a spiral manner from the inner to the outer side, and conveys the musculo-spiral nerve and the superior profunda vessels.

The musculo-spiral nerve, arising in the axilla from the posterior cord of the brachial plexus, lies in the musculo-spiral groove, covered by the long head of the triceps, and between the inner and outer heads of that muscle, and after piercing the external intermuscular septum, gains the interval between the brachialis anticus and brachio-radialis muscles. (See Antecubital Fossa.—No 3.)

In its course it gives off the following branches;—

- (1) On the inner side of the arm, an internal cutaneous branch, a branch to the long head of the triceps, and a branch to the inner head of that muscle, the latter being called the ulnar collateral nerve.
- (2) In the musculo-spiral groove, branches to all the heads of the triceps, and also a branch which is noticeable, as it runs down in the inner head muscle and ends in the anconeus muscle. While in the groove, it also gives off two external cutaneous branches, an upper and a lower, which supply regions of skin on the back and outer sides of the arm and forearm.
- (3) In the last part of its course it gives muscular branches to the brachialis anticus, brachio-radialis, extensor carpi radialis longior and sometimes also to the extensor carpi radialis brevior muscles, and terminates in the radial and posterior interosseous nerves.

The superior profunda artery accompanies the nerve in the region seen here, and divides into two branches which run to the elbow behind and in front of the external intermuscular septum respectively, to take part in the anastomosis about the elbow-joint.

*The figures indicate:—*

- |                           |  |  |
|---------------------------|--|--|
| 1. Deltoid.               | 5. Brachialis anticus.                 | 9. Lower external cutaneous branch.      |
| 2. Outer head of triceps. | 6. Musculo-spiral nerve.               | 10. Nerve to inner head of triceps.      |
| 3. Long head of triceps.  | 7. Nerve to brachialis anticus.        | 11. Branch of superior profunda vessels. |
| 4. Inner head of triceps. | 8. Cutaneous branch of musculo-spiral. |  |

SECTION IV.





## UPPER LIMB.

## BACK OF FOREARM AND WRIST JOINT.—No. 1. TWO SPECIMENS.

A. This dissection shows the arrangement of the superficial muscles of the back of the forearm.

The view should be compared with that of Surface Anatomy, No. 5, and the groups of muscles identified, viz., an outer set consisting of the brachio-radialis and the two radial extensors, which is separated, lower down, by the extensor ossis metacarpi and extensor primi internodii pollicis from an inner set, which consists of the extensor communis digitorum, extensor proprius minimi digiti, and extensor carpi ulnaris.

The extensor proprius indicis and extensor secundi internodii pollicis tendons are shown still lower down.

B. Wrist-Joint. A section has been made through the wrist, to show the principal synovial cavities, and the triangular fibro-cartilage of the wrist-joint.

The synovial sacs are as follows:—

1. There is a cavity for the radio-carpal and one also for the inferior radio-ulnar joints.

2. There is a cavity between the proximal and distal row of carpal bones, which is continuous with the cavity of the carpo-metacarpal articulation.

The joints in this region have the following arrangement:—

There are three lines of articulation more or less transverse in character. The first between the radius and the triangular fibro-cartilage on the one hand and the proximal row of the carpus on the other. The cavity of this joint is shut off from the others.

The second line of articulation extends in an S-shaped curve across the wrist, between the proximal and distal rows of carpal bones.

The third line of articulations between the distal row of the carpus and the bases of the metacarpals is often divided into two parts by a ligament, as here, passing from the unciform to the base of the third metacarpal. When that is so, there is a separate inner synovial cavity, and an outer one which communicates with the second line of articulations. The intermetacarpal joints are continuous with the adjacent part of this line of articulation.

3. The thumb has a separate joint for itself, at the articulation between the trapezium and first metacarpal bone.

*The figures indicate:—**In A.*

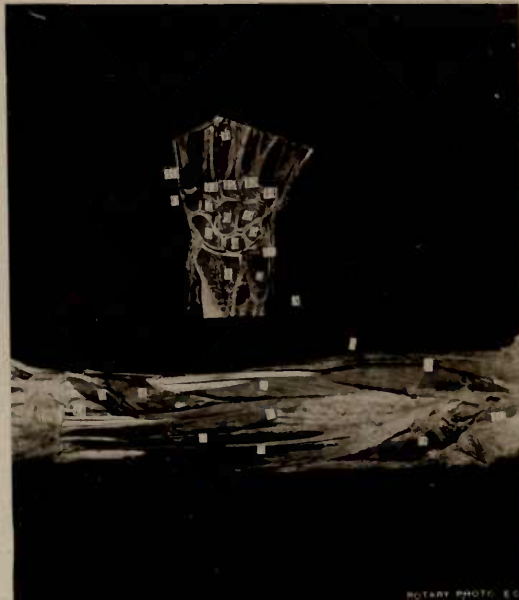
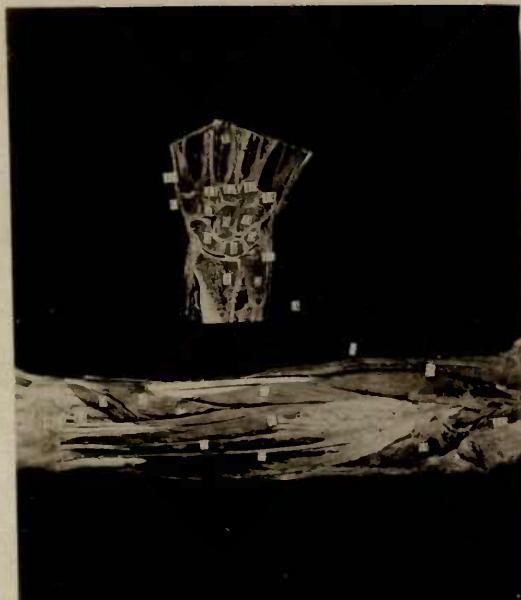
- Muscles. 1. Brachio-radialis.  
2. Extensor carpi radialis longior.  
3. Extensor carpi radialis brevior.  
4. Extensor ossis metacarpi pollicis.  
5. Extensor primi internodii pollicis.  
6. Extensor communis digitorum.  
7. Extensor proprius minimi digiti.  
8. Extensor carpi ulnaris.

*In B.*

9. Anconeus.  
10. Triceps.  
11. Extensor secundi internodii pollicis.  
Ligament. 12. Posterior annular ligament.

- Bones. 1. Radius.  
2. Ulna.  
3. Scaphoid.  
4. Semilunar.  
5. Cuneiform.

6. Trapezium.  
7. Trapezoid.  
8. Os magnum.  
9. Unciform.  
10. First metacarpal.  
11. Second metacarpal.  
12. Third metacarpal.  
13. Fourth metacarpal.  
14. Fifth metacarpal.  
Ligament. 15. Triangular ligament.





## UPPER LIMB.

## AXILLA—No. 1.

THE SKIN AND FASCLE HAVE BEEN REMOVED, LEAVING THE CENTRAL PORTION OF THE AXILLARY, OR DEEP FASCIA, TO SHOW ITS CONNECTIONS, AND TO SHOW THE SUPERFICIAL NERVES, ETC., WHICH PASS DOWN THE ARM.

The axillary fascia is strong and thick, and forms the floor of the axillary space. It is continuous with the deep fascia of adjacent regions, passing, in front, on to the pectoralis major, on the inner side to the serratus magnus, behind, to the latissimus dorsi and teres major muscles, while on the outer side, it is in continuity with the general fascial investment of the upper arm. As it is connected by areolar tissue to the structures of the interior of the axillary space, it is drawn up and forms the distinct fossa seen here.

It is pierced by some small cutaneous vessels and nerves. This fascia limits any swellings, especially fluid ones, which may occur in the axilla, and resists the spread of such to the surface.

It requires to be divided in opening axillary abscesses, and this is best done by Hilton's method, using a blunt instrument.

The structures which pass from the axilla down the upper arm are shown as seen by removal of a portion of the deep fascia. Of these, the axillary vein should always be identified first of all. It lies immediately subjacent to the deep fascia, and, when distended, overlaps and conceals the artery and some of the nerves.

Along the inner side of the vein is found the lesser internal cutaneous nerve, which unites in a variable manner with the lateral cutaneous branch of the second intercostal nerve, and with it runs down to supply the skin on the inner aspect of the arm as far as to the elbow.

Some branches of the lesser internal cutaneous nerve are seen running outwards on the coraco-brachialis and biceps.

The internal cutaneous nerve lies, in this region, to the outer side of the vein, and becomes cutaneous about the middle of the arm.

*The figures indicate—*

- |  |                               |
|--|-------------------------------|
| 1. Anterior fold of axilla (pectoralis major). | 6. Triceps muscle, long head. |
| 2. Inner wall " " (serratus magnus).           | 7. Axillary vein.             |
| 3. Posterior wall " " (latissimus dorsi).      | 8. Axillary artery.           |
| 4. Coraco-brachialis muscle.                   | 9. Axillary fascia.           |
| 5. Biceps muscle, short head.                  |                               |





## UPPER LIMB.

## AXILLA—No. 2.

THE GREATER PART OF THE PECTORALIS MAJOR MUSCLE HAS BEEN REMOVED, OPENING UP THE AXILLARY CAVITY FROM THE FRONT, AND THE CONTENTS OF THE AXILLA HAVE BEEN EXPOSED.

The structures lying within the axilla are very numerous, and most of them are highly important.

On the inner wall of the space, which is formed by the ribs and by the serratus magnus and intercostal muscles, lie the long thoracic vessels, a number of lymphatic glands, and, further back, the nerve to the serratus magnus muscle.

On the outer wall are found the structures passing to and from the arm, and the position of some of these has been already described (see No. 1).

The median nerve is now seen to lie very much in front of the axillary artery, while, higher up, the artery and the median nerve are crossed by a large and important vein, the outer of the two venæ comites of the brachial artery. The musculo-cutaneous nerve lies still further to the outer side.

The only structures visible on the posterior wall are the subscapular vessels and long subscapular nerve.

The axillary glands were somewhat enlarged in this subject, and therefore a good idea is obtained of the position and relations of some of them.

They are usually found to be disposed in the following sets :—

(1) One set lies along the axillary vessels, receiving tributaries from the arm ; (2) Another set lies along the margin of the subscapularis muscle, receiving the vessels from the back ; (3) A third set lies along the pectoralis minor and inner wall of the axilla, receiving vessels from the mammary region and front of chest. The great bulk of these glands lies in the fourth intercostal space, and it is this group which has mainly been enlarged in this specimen. The lymphatic vessels from them pass upwards towards the apex of the axilla, and converge towards a gland which is seen to be much enlarged ; (4) A central group of glands, lying in a pocket in the deep fascia, or sometimes superficial to it, may also be found.

*The figures indicate—*

- Muscles.** 1. Pectoralis major.  
2. Pectoralis minor and superior thoracic vessels.  
3. Serratus magnus.  
4. Deltoid.  
5. Short head of biceps.  
6. Coraco-brachialis.  
7. Latissimus dorsi.  
8. Teres major.

- Vessels.** 9. Outer of the venæ comites of brachial artery.  
10. Axillary vein.  
11. Long thoracic vessels.  
12. Subscapular vessels and long subscapular nerve.  
13. Cephalic vein.  
14. Axillary artery.  
**Nerves.** 15. Musculo-cutaneous.

- Lymphatics.** 16. Intercosto-humeral.  
17. Median.  
18. Internal cutaneous.  
19. Nerve of Bell.  
20. Lymphatic gland, enlarged, from mamma.  
21. Lymphatic gland and vessel from arm.  
22. Upper lymphatic gland.





## UPPER LIMB.

## AXILLA—No. 3.

THE PECTORALIS MAJOR HAS BEEN REFLECTED TO SHOW THE COSTO-CORACOID MEMBRANE.

Above the upper margin of the pectoralis minor, and below the subclavius muscle and clavicle, there is a small interval which is filled in by the costo-coracoid membrane. The formation and the relations of this membrane are as follows:—

The subclavius muscle above is enclosed in a strong fibrous sheath, which is attached to the under surface of the clavicle in front of the muscle and behind it.

The inner part of this membrane is extremely strong, and passes downwards to be attached to the first rib (12). The outer part is less strong, and below the subclavius muscle it is represented merely by a thin membrane which blends with the fascia of the pectoralis minor, and also passes deeply to join the axillary sheath.

The stronger portion passes from the first rib outwards to the coracoid process in a curved manner, and is called the costo-coracoid ligament.

Lying on the costo-coracoid membrane is a lymphatic gland, which is liable to infection from cancer of the breast. The membrane is pierced by the external anterior thoracic nerve as it passes to the pectoralis major, by the thoracic axis vessels, and by the cephalic vein. The thoracic axis vein is large, the artery has only a short course, and divides into branches which go to the pectoralis muscles, to the deltoid (acromial and humeral branches), and to the subclavius muscle (clavicular branch).

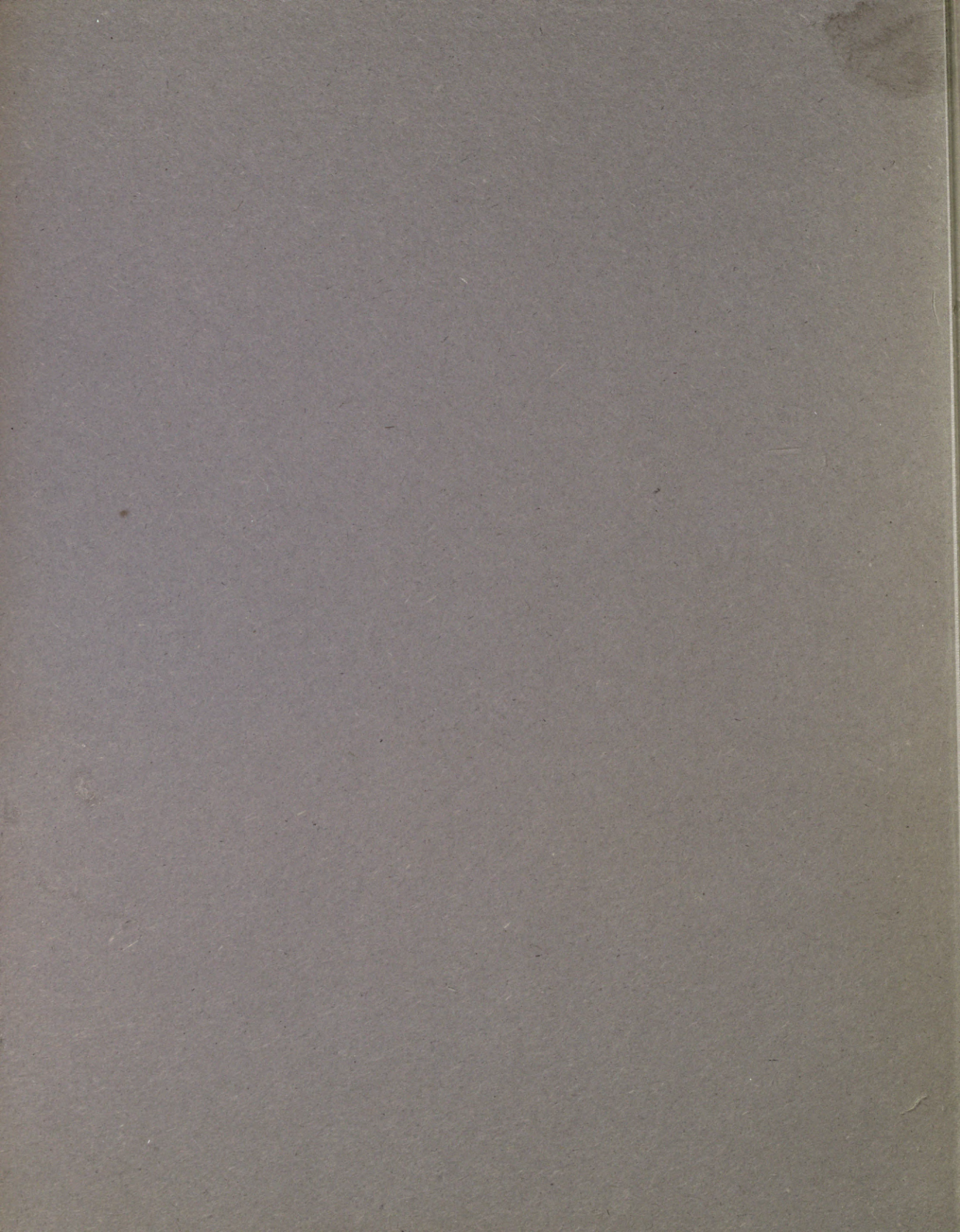
The lymphatic gland in this specimen is enlarged. Usually it is very small, but it can generally be detected by careful dissection.

*The figures indicate—*

- Muscles.**
1. Deltoid (divided).
  2. Pectoralis major.
  3. Long tendon of biceps.
  4. Short head of biceps.
  5. Coraco-brachialis.
  6. Pectoralis minor.
  7. Subclavius.

- Nerves and Vessels.**
8. Acromio-thoracic vein.
  9. Acromio-thoracic artery.
  10. External anterior thoracic nerve.
  11. Gland on costo-coracoid membrane.
  12. Costo-coracoid membrane, inner part.
  13. Internal anterior thoracic nerve.





## UPPER LIMB.

## AXILLA.—No. 4.

THE ANTERIOR WALL OF THE AXILLA HAS BEEN REMOVED, TO SHOW THE ARRANGEMENT OF THE STRUCTURES WITHIN THE CAVITY.

The axillary vessels, which are directly continuous with the subclavian, commence at the outer border of the first rib, and run down to the lower border of the *teres major* tendon. The lower part of the vein has been removed, in the region where it overlaps the artery, but the vein has been left in the upper part, where it lies at a lower level than the artery and on an anterior plane.

The vessels rest upon the first intercostal space in the upper part, then on some areolar tissue, by which they are separated from the *subscapularis* muscle, and then they lie on the *latissimus dorsi* and *teres major* tendons.

They are covered in front by the *pectoralis major* and *minor* muscles and by the *costo-coracoid* membrane.

The great nerve cords of the brachial plexus lie at first above the artery, but they soon come to lie on different sides of that vessel, the inner cord on the inner side, the outer cord external to, and the posterior cord behind the artery. It will be seen, however, that the position of the posterior cord of the plexus is, at first, rather at a higher level than the other cords.

The external and internal anterior thoracic nerves form a plexus around the artery.

*The figures indicate—*

## Muscles.

1. Deltoid.
2. Pectoralis major.
3. Biceps, long head.
4. Coraco-brachialis and biceps, short head.
5. Pectoralis minor.
6. External intercostal.

Other structures. 7. Axillary vein.

8. Axillary artery.
9. Outer cord.
10. Posterior cord.
11. Suprascapular nerve.
12. Superior thoracic vessels.
13. Internal anterior thoracic nerve.
14. Anterior circumflex artery.
15. Coraco-acromial ligament.

THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720  
BIOLOGY LIBRARY





## UPPER LIMB.

## ANTECUBITAL FOSSA—No. 1.

THE SKIN AND SUPERFICIAL FASCIA HAVE BEEN REMOVED, LEAVING THE CUTANEOUS NERVES AND VESSELS IN SITU.

The antecubital fossa is a small hollow opposite the front of the elbow-joint bounded by muscles, and containing principally nerves and blood-vessels. Its roof is formed by skin and fasciæ, and contains the following structures :—

1. **Nerves.**—The cutaneous nerves in this region are derived from the internal and external cutaneous nerves. The former nerve pierces the deep fascia about the centre of the upper arm. Two branches, anterior and posterior, pass from it, and supply the front and inner side of the forearm. The branches pass, some over and some under the median basilic vein. The external cutaneous nerve,—the terminal branch of the musculo-cutaneous nerve,—becomes cutaneous at the outer border of the tendon of the biceps, and supplies the front and outer side of the forearm.

2. **Veins.**—The arrangement of the superficial veins in this region is very variable. There is, however, almost constantly, a large median basilic vein, which passes obliquely upwards and inwards from the centre of the antecubital fossa, and this is the vessel from which blood may be withdrawn in phlebotomy, or into which fluid may be transfused.

Its course and relations are therefore of interest, and it is formed in the following manner :—

The median vein passes up the centre of the forearm, and receives a tributary called the profunda vein. It then divides into two branches, the outer, usually smaller, is the median cephalic, and the inner is the median basilic vein. This latter trunk is joined by one or two ulnar branches, and the resulting vessel is the basilic, while the median cephalic is joined by a radial vein and is then called the cephalic.

3. **Lymphatic glands.**—Two small lymphatic glands are seen lying in the superficial fascia just above the inner condyle. These glands receive lymphatic vessels from the forearm and hand.

*The figures indicate—*

Veins—1. Median.

2. Median cephalic.

3. Median basilic.

4. Anterior ulnar.

5. Basilic.

Veins—6. Posterior ulnar.

Nerves—7. Internal cutaneous.

8. Musculo- or external cutaneous.

Glands—9. Epitrochlear lymphatic glands (two).





## UPPER LIMB.

## ANTECUBITAL FOSSA—No. 2.

THE STRUCTURES FORMING THE ROOF OF THE SPACE HAVE BEEN REMOVED, THE BICIPITAL FASCIA BEING LEFT, AND THE STRUCTURES CONTAINED WITHIN IT HAVE BEEN EXPOSED.

The bicipital or semilunar fascia is a strong band of deep fascia, which passes from the tendon of the biceps muscle to the fascia on the inner side of the forearm, and is an important insertion for that muscle.

It crosses the brachial artery.

The lateral boundaries of the antecubital fossa are the supinator longus (brachio-radialis) on the outer side, and the pronator radii teres on the inner, while the base of the space is arbitrarily taken to be a line between the condyles.

The tendon of the biceps passes into the interior of the space, to gain its insertion into the back part of the bicipital tuberosity of the radius.

On the inner side of the biceps lie the brachial artery, with its venæ comites, and the median nerve lying to the inner side of the vessel. These latter structures are seen resting on the brachialis anticus muscle.

The brachial artery has bifurcated high up and is represented in this specimen by two vessels lying, one superficially and the other deeply, and the median nerve has crossed by passing under cover of the vessels, while more frequently it crosses the artery superficially.

These variations in the artery which are of frequent occurrence, require attention in such operations as ligature of the brachial, since both trunks must be tied.

*The figures indicate—*

- |  |                                     |
|--|-------------------------------------|
| 1. Bicipital fascia and biceps muscle. | 6. Flexor carpi radialis muscle.    |
| 2. Brachialis anticus muscle.          | 7. Brachial artery and venæ comites |
| 3. Triceps muscle.                     | 8. Median nerve.                    |
| 4. Brachio-radialis muscle.            | 9. Musculo-cutaneous nerve,         |
| 5. Pronator radii teres muscle.        |                                     |





## UPPER LIMB.

## ANTECUBITAL FOSSA—No. 3.

THE SPACE HAS BEEN OPENED UP BY DIVIDING THE BICIPITAL FASCIA AND DRAWING THE MUSCLES ASIDE,  
AND THE CONTENTS ARE EXPOSED.

Within the antecubital fossa, the brachial artery divides into its two terminal branches, the musculo-spiral nerve divides into the radial and posterior interosseous nerves, the median nerve gives off several muscular branches, and lying deeply on each side is found a recurrent articular artery, from the radial artery on the outer side and from the ulnar on the inner.

The musculo-spiral nerve divides opposite the bend of the elbow, where it lies between the brachialis anticus and brachio-radialis muscles, after giving off muscular branches to the brachio-radialis and extensor carpi radialis longior. The posterior interosseous branch disappears into the substance of the supinator brevis muscle, while the radial nerve runs down, and comes to lie beside the radial artery.

The median nerve passes out of the antecubital fossa by passing between the two heads of the pronator radii teres muscle.

Thus both the posterior interosseous and median nerves are liable to injurious compression by contraction of the muscles through which they pass. The median nerve contains sensory fibres, and thus pain may be produced as well as paresis of muscles, but the posterior interosseous is distributed to muscles, and therefore there are no sensory phenomena produced.

The recurrent articular arteries take part in the anastomosis about the elbow, anastomosing with branches of the brachial artery seen in another view.

The high division of the brachial artery in this specimen produces some conditions which are only occasionally present, but the condition illustrated occurs with considerable frequency.

The floor of the fossa is now seen to be formed by the brachialis anticus and supinator brevis muscles.

*The figures indicate—*

- |          |                                |          |                             |
|----------|--------------------------------|----------|-----------------------------|
| Muscles. | 1. Pronator radii teres.       | Nerves.  | 6. Musculo-cutaneous.       |
|          | 2. Brachialis anticus.         |          | 7. Median.                  |
|          | 3. Brachio-radialis.           |          | 8. Musculo-spiral.          |
|          | 4. Tendon of biceps.           | Vessels. | 9. Radial recurrent artery. |
|          | 5. Semilunar fascia of biceps. |          |                             |





**UPPER LIMB.**  
**FRONT OF FOREARM—No. 1.**

THE GENERAL LIBRARY  
 UNIVERSITY OF CALIFORNIA  
 BERKELEY, CALIFORNIA 94720

THE SUPERFICIAL STRUCTURES HAVE BEEN REMOVED TO SHOW THE MUSCLES. COMPARE WITH THIS THE VIEW OF SURFACE ANATOMY NO. 4.

The superficial muscles of the front of the forearm are arranged as follows:—The brachio-radialis muscle lies along the outer border of the forearm. To its inner side lies a group of superficial muscles belonging to the pronator and flexor group, and comprising the pronator radii teres (2), flexor carpi radialis (3), palmaris longus (4), and flexor carpi ulnaris (6); while the flexor sublimis digitorum (5) lies under cover of them.

These muscles have a common origin from the front of the internal condyle, from the investing fascia, and from the intermuscular septa, and the pronator muscle, the flexor carpi ulnaris and the flexor sublimis digitorum have each one or more accessory heads of origin, all of which lie at a deeper level.

Lower down in the forearm the fleshy bellies of these muscles are largely replaced by tendons, and the principal vessels and nerves come to lie nearer the surface between the tendons.

Thus, at the wrist, the radial artery, with its venæ comites, lies between the brachio-radialis and the flexor carpi radialis, and the ulnar vessels and nerve lie between the flexor carpi ulnaris and the flexor sublimis digitorum tendons, while the median nerve lies between the flexor carpi radialis and the palmaris longus.

The radial nerve does not accompany the corresponding artery to the wrist-joint, but in the lower third of the forearm it leaves it, and passes under the brachio-radialis to the back of the wrist.

*The figures indicate—*

- |   |  |
|---|--|
| <p><b>Muscles.</b> 1. Brachio-radialis.<br/>           2. Pronator radii teres.<br/>           3. Flexor carpi radialis.<br/>           4. Palmaris longus.<br/>           5. Flexor sublimis digitorum.<br/>           6. „ carpi ulnaris.<br/>           7. Ext. ossis metacarpi pollicis and posterior annular ligament.</p> | <p>9. Pisiform bone.<br/>           10. Anterior annular ligament, and ulnar artery passing over it.<br/>           11. Brachial artery and venæ comites.<br/>           12. Anastomotica magna artery.<br/>           13. Musculo-cutaneous nerve (a recurrent branch).<br/>           14. Radial nerve.<br/>           15. Radial vessels.</p> |
|---|--|

**Other structures.** 8. Median nerve.





## UPPER LIMB.

## FRONT OF FOREARM AND PALM—No. 2.

THE DISSECTION HAS BEEN CONTINUED SO AS TO EXPOSE THE DEEPER LYING STRUCTURES IN THE PALM, ESPECIALLY THE DEEP PALMAR ARCH, AND THE MUSCLES OF THE DIFFERENT LAYERS IN THE FOREARM HAVE BEEN DIVIDED AT DIFFERENT LEVELS.

The deep palmar arch is formed by the terminal part of the radial artery which enters the palm through the upper part of the first interosseous space between the heads of the first dorsal interosseous muscle, and appears between the adjacent margins of the adductor obliquus and adductor transversus pollicis. It crosses the bases of the metacarpal bones and the interossei, and anastomoses with the deep branch of the ulnar artery.

It is accompanied by the deep branch of the ulnar nerve, and it gives off some branches as follows:—(1) recurrent, which run up to the front of the carpus; (2) superior perforating, which pass backwards in the upper part of the three interosseous spaces to the dorsum of the hand; and (3) three palmar interosseous branches, of which two are seen, which pass forwards in front of the interosseous spaces and join the digital branches of the superficial palmar arch.

The deep branch of the ulnar nerve supplies all the muscles of the palm which lie to the inner side of the tendon of the flexor longus pollicis, except the two outer lumbricals, which receive their nerve supply from the median nerve.

The pronator quadratus is seen to be a flat, square-shaped muscle, which arises from the anterior surface of the ulna in its lower fourth, and is inserted into the anterior and inner surface of the lower end of the radius.

The radial artery is seen to pass from the front of the forearm by winding round the outer side of the wrist joint, under cover of the tendons of the extensor ossis metacarpi pollicis, and extensor primi internodii pollicis.

In the forearm, the median nerve is seen to lie under cover of the flexor sublimis digitorum, on the surface of the flexor longus pollicis, while the ulnar nerve and artery, at the same level, lie on the flexor profundus digitorum, under cover of the flexor carpi ulnaris, and to the inner side of the flexor sublimis digitorum.

*The figures indicate—*

- |                                       |   |                                 |
|---------------------------------------|---|---------------------------------|
| 1. Pisiform bone.                     | 9. Flexor sublimis digitorum.                   | 17. Adductor obliquus pollicis. |
| 2. Scaphoid.                          | 10. Palmaris longus.                            | 18. Opponens pollicis.          |
| 3. Extensor ossis metacarpi pollicis. | 11. Flexor carpi ulnaris.                       | 19. Opponens minimi digiti.     |
| 4. Flexor longus pollicis.            | 12. Flexor profundus digitorum.                 | 20. Interosseous muscles.       |
| 5. Pronator quadratus.                | 13. Radial artery.                              | 21. Anterior ligament of wrist. |
| 6. Transverse metacarpal ligament.    | 14. Ulnar artery and nerve.                     | 22. Median nerve and artery.    |
| 7. Tendon of a lumbrical muscle.      | 15. Deep palmar arch and branch of ulnar nerve. | 23. Radial nerve.               |
| 8. Flexor carpi radialis.             | 16. Adductor transversus pollicis.              | 24. Brachio-radialis muscle.    |





THE GENERAL LIBRARY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720

## UPPER LIMB.

## PALM OF HAND.—No. 1.

THE SKIN AND MOST OF THE SUPERFICIAL FASCIA HAVE BEEN REMOVED TO SHOW THE DEEP FASCIA AND THE CUTANEOUS NERVES AND VESSELS.

1. Superficial fascia. This fascia at the root of the fingers shows an arrangement similar to that found in the foot, in the form of a transverse band of fibres at the root of the fingers called the superficial transverse ligament.

In the fascia over the ball of the little finger a small muscle appears, the palmaris brevis, which arises from the central part of the deep fascia, and is inserted into the skin on the ulnar side of the hand.

2. The deep fascia is in three parts, a central and two lateral. The lateral portions are weak and invest the short muscles of the ball of the thumb and little finger, while the central portion is strong, and is triangular in shape. The apex is attached to the anterior annular ligament at the wrist, and gives insertion to the tendon of the palmaris longus, and the base, as in the foot, is prolonged in the form of slips which pass to the digits and become continuous with the fibrous sheaths for the flexor tendons. Between these slips digital vessels and nerves appear.

3. The cutaneous nerves are numerous and are arranged as follows from the radial to the ulnar sides:—(1) A branch of the radial nerve to the outer side and back of the thumb. (2) Branches of the median nerve, supplying both sides of the thumb. The outer one is seen. (3) The median nerve also sends branches to the index finger on its radial side (15) and to the two adjacent interdigital spaces (16 and 17), and these latter branches supply the adjacent sides of the fingers between which they lie. (4) The ulnar nerve supplies the two branches, one to the inner side of the little finger, and another to the adjacent sides of the little and ring fingers (14).

4. The ulnar nerve and artery have been exposed at the point where they pass in front of the anterior annular ligament by removing a band of fascia which covers them at that point.

*The figures indicate—*

- |                                      |                               |  |
|--------------------------------------|-------------------------------|--|
| 1. Central portion of palmar fascia. | 7. Deep fascia of forearm.    | 13. Ulnar artery and nerve.                  |
| 2. Superficial transverse ligament.  | 8. Anterior annular ligament  | 14. Digital branches of ulnar nerve.         |
| 3. Fibrous flexor sheath.            | 9. Palmaris longus tendon.    | 15, 16, 17. Digital branches of median nerve |
| 4. Palmaris brevis muscle.           | 10. Radial nerve.             | and digital arteries.                        |
| 5. Abductor pollicis muscle.         | 11. External cutaneous nerve. | 18. Palmar branch of median nerve.           |
| 6. Outermost lumbrical muscle.       | 12. Pisiform bone.            |  |

SECTION IV.





## UPPER LIMB.

## PALM OF HAND.—No. 2.

THE DEEP FASCIA HAS BEEN REMOVED, TO SHOW THE MUSCLES, NERVES, VESSELS, AND TENDONS LYING UNDER IT.

The flexor sheaths of two digits have been opened to show the arrangement of the tendons; and the two middle lumbrical muscles have been cut away.

**Muscles.** The muscles of the ball of the thumb are—(1) the abductor pollicis, which is the most superficial, (2) the opponens pollicis, which lies largely under cover of it, (3) the flexor brevis pollicis, which lies to the inner side.

The superficial palmar arch is formed by the ulnar artery, and may be completed in several different ways, e.g. by anastomosing with the superficial volar; or, as here, it may not communicate with any large vessel on the radial side of the palm.

The arch rests successively on the anterior annular ligament, on the short muscles of the little finger, on the flexor tendons and lumbrical muscles, and on the digital branches of the median nerve. The ulnar artery gives off a profunda branch, and four digital vessels, whose distribution is well seen here, arise from the palmar arch.

The ulnar nerve lies on the inner side of the ulnar artery, just external to the pisiform bone, and soon gives off a deep branch which passes between the abductor and flexor brevis minimi digiti, while the superficial division passes on and divides into two digital branches. The inner of these is reinforced in this specimen by a twig from the dorsal branch of the ulnar nerve.

The median nerve enters the palm under cover of the anterior annular ligament, and therefore is not seen in that part of its course. It soon divides into (1) an outer branch, from which a stout nerve is given to the three muscles of the ball of the thumb, and digital branches to both sides of the thumb and to the radial side of the index finger, and (2) an inner division, from which two inner digital branches arise. The digital branches of this nerve give the supply to the outer two and sometimes three lumbricals.

There is here the communication in the palm between the median and ulnar nerves which is sometimes present.

*The figures indicate—*

Muscles. 1. Opponens pollicis.

2. Abductor „

3. Flexor brevis „

4. 1st lumbrical.

5. Abductor minimi digiti.

6. Tendon of flexor sublimis.

7. Tendon of flexor profundus.

Vessels. 8. Superficial volar.

9. Ulnar.

10. Superficial palmar arch.

16. Ligamentum longum of flexor tendon.

11. Princeps pollicis

Nerves, 12. Ulnar.

etc. 13. Outer digital branch of ulnar.

14. Muscular branch of median.

15. Radial.





## UPPER LIMB.

## ARTICULATIONS—No. 1.

## LIGAMENTS OF THE SHOULDER AND ELBOW-JOINTS SEEN FROM THE FRONT. THREE SPECIMENS.

A. Attached to the coracoid process are the coraco-humeral, coraco-acromial, and coraco-clavicular ligaments. The coraco-acromial ligament (3) is triangular in shape, the base is attached to the outer margin of the coracoid process, and the apex to the tip of the acromion. The central portion is weak, and sometimes, as here, shows a triangular aperture. The outer part overlies the capsular ligament of the shoulder, from which it is separated by a bursa.

The coraco-humeral ligament (4) lies at a deeper level, and passes from the root and outer border of the coracoid process to the tuberosities of the humerus, blending with the capsular ligament.

The acromio-clavicular capsular ligament (2) consists of short strong fibres, which do not require special description. The coraco-clavicular ligament (1) is in two bands—of which the anterior, which is seen here, is called the trapezoid band. It passes from the root of the coracoid process to the under surface of the clavicle. The capsular ligament of the shoulder-joint (7) is a dense and strong but lax structure, attached to the scapula around the glenoid ligament internally, and to the anatomical neck of the humerus externally. Below the coracoid process, there is an aperture in it, through which the synovial membrane communicates with a bursa below the subscapularis muscle, and between the tuberosities of the humerus is another opening (8) which transmits the long tendon of the biceps muscle.

B. The Anterior ligament of the elbow (9) is attached, above, to the front of the humerus, above the radial and coronoid fossæ, and, below, blends with the orbicular ligament externally (11), and is attached to the tip and margins of the coronoid process of the ulna internally.

C. The orbicular ligament (12) surrounds the neck of the radius like a collar, and is attached to the anterior and posterior margins of the lesser sigmoid cavity of the ulna.

*The figures indicate ligaments and tendons as follows—*

- In A. 1. Trapezoid band.  
2. Superior acromio-clavicular.  
3. Coraco-acromial.  
4. Coraco-humeral.  
5. Pectoralis minor.  
6. Coraco-brachialis and biceps.  
7. Capsular ligament of shoulder.

8. Long tendon of biceps and transverse ligament.

- In B. 9. Anterior ligament of elbow.

10. Brachialis anticus.

11. Orbicular ligament.

- In C. 12. Orbicular ligament.

13. Internal lateral ligament of elbow.







